



1

00:00:10,269 --> 00:00:13,940

WHEN YOU HEAR THE NAME HUBBLE, YOU PROBABLY
THINK ABOUT THE TELESCOPE.

2

00:00:13,940 --> 00:00:18,650

BUT ALMOST A CENTURY AGO, THAT NAME WAS SYNONYMOUS
WITH ONE OF THE MOST PREEMINENT ASTRONOMERS

3

00:00:18,650 --> 00:00:21,340

OF THE DAY... EDWIN HUBBLE.

4

00:00:21,340 --> 00:00:28,029

Owen Gingerich: "He was certainly one of
the leading observational astronomers of the

5

00:00:28,029 --> 00:00:34,870

20th Century. If you had to pick sort of
the leading observer, Hubble would be in competition

6

00:00:34,870 --> 00:00:36,280

for first place.

7

00:00:36,280 --> 00:00:43,000

BORN ON NOVEMBER 20, 1889 IN MARSHFIELD, MISSOURI,
THE FOCUS OF THE FUTURE ASTRONOMER'S EARLY

8

00:00:43,000 --> 00:00:45,930

LIFE IS NOT ON THE SKY, BUT ON ATHLETICS.

9

00:00:45,930 --> 00:00:51,120

Dale E Christianson : "He capped a brilliant
spring at the Northwestern University Interscholastic

10

00:00:51,120 --> 00:00:58,120

Meet on May 6, 1906, clearing the high bar
at 5 feet 8 ½ inches. Hubble was hailed in

11

00:00:58,610 --> 00:01:04,670

the papers for establishing a new state record

in the event. Dale E. Christianson, Author

12

00:01:04,670 --> 00:01:09,310
of Edwin Hubble, Mariner of the Nebulae”

13

00:01:09,310 --> 00:01:14,490
HUBBLE GOES ON TO PLAY CENTER FOR THE UNIVERSITY
OF CHICAGO BASKETBALL TEAM... BUT HE... IS

14

00:01:14,490 --> 00:01:20,200
DRIVING TOWARDS ANOTHER GOAL... THE PRESTIGIOUS
RHODES SCHOLARSHIP. IT’S AN HONOR BESTOWED

15

00:01:20,200 --> 00:01:24,399
TO CANDIDATES WHO OFTEN BECOME FUTURE US PRESIDENTS
AND CHIEF JUSTICES.

16

00:01:24,399 --> 00:01:30,420
Robert Andrews Millikan: “Seldom have I
known a man who seems to be better qualified

17

00:01:30,420 --> 00:01:36,509
to meet the conditions imposed by the founder
of the Rhodes scholarships than is Mr. Hubble.

18

00:01:36,509 --> 00:01:39,929
1923 Nobel Laureate Robert Andrews Millikan”

19

00:01:39,929 --> 00:01:45,869
THE RHODES COMMITTEE SELECTS HUBBLE AS ONE
OF THE TWO AWARDED FROM THE STATE OF ILLINOIS.

20

00:01:45,869 --> 00:01:51,209
HE SPENDS THE NEXT 4 YEARS AT ENGLAND’S
OXFORD UNIVERSITY... AN EXPERIENCE THAT FOREVER

21

00:01:51,209 --> 00:01:52,310
TRANSFORMS HIM.

22

00:01:52,310 --> 00:01:58,740

Don Nicholson: "He fell in love with the British way of doing things. Their accent...

23

00:01:58,740 --> 00:02:01,810

their riding britches, and the works."

24

00:02:01,810 --> 00:02:06,659

WHILE STUDYING LAW AT OXFORD, EDWIN CONFIDES TO HIS MOTHER HE IS GOING TO TAKE A DIFFERENT

25

00:02:06,659 --> 00:02:07,469

CAREER PATH.

26

00:02:07,469 --> 00:02:13,099

Edwin Hubble: "Work, to be pleasant, must be toward some great end, an end so great

27

00:02:13,099 --> 00:02:18,690

that dreams of it, anticipation of it overcomes all aversion to labor. If only I find some

28

00:02:18,690 --> 00:02:25,690

principle, for whose sake I could leave everything else and devote my life. Edwin Powell Hubble"

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00:02:25,700 --> 00:02:28,160

FOR HUBBLE, THAT LIFE IS IN ASTRONOMY.

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00:02:28,160 --> 00:02:34,530

Nicholson: "He saw the changes that were going on in astronomy. He got interested in it

31

00:02:34,530 --> 00:02:38,920

and the interest became pretty consuming."

32

00:02:38,920 --> 00:02:43,950

WHILE PURSUING HIS DOCTORATE AT THE UNIVERSITY OF CHICAGO, HUBBLE LANDS A JOB AT THE WORLD'S

33

00:02:43,950 --> 00:02:49,420

LARGEST TELESCOPE. Nicholson: A lot of spectroscopy has been done with it. My father discovered

34

00:02:49,420 --> 00:02:54,870

three of Jupiter's satellites. DON NICHOLSON'S FATHER, SETH, WAS ONE OF THE ASTRONOMERS ON

35

00:02:54,870 --> 00:02:57,790

STAFF DURING THE EARLY DAYS OF MOUNT WILSON....

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00:02:57,790 --> 00:03:02,460

Nicholson: "Mount Wilson was, without a question, the preeminent observatory in the

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00:03:02,460 --> 00:03:09,460

world for about the first half of the last century. An observatory that was designed

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00:03:09,620 --> 00:03:16,620

not to do that kind of thing that had been done for centuries before but the so called

39

00:03:16,760 --> 00:03:23,760

new astronomy. What we largely call cosmology today. No other observatory in the world had

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00:03:24,540 --> 00:03:29,980

the equipment, had the staff that Mt. Wilson had."

41

00:03:29,980 --> 00:03:35,490

BUT HUBBLE'S CAREER AT MT WILSON HAS TO WAIT. EDWIN'S BELOVED ENGLAND IS ENTRENCHED

42

00:03:35,490 --> 00:03:36,840

IN WORLD WAR I.

43

00:03:36,840 --> 00:03:42,350

Christianson: "He was haunted by the images of the gifted young men he had known at Oxford..."

44

00:03:42,350 --> 00:03:47,480

now their corpses lay scattered along the Western Front. Dale E. Christianson"

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00:03:47,480 --> 00:03:54,480

HE JOINS THE ALLIED EFFORT BUT NEVER SEES COMBAT. EDWIN RETURNS HOME AND FOCUSES ON

46

00:03:54,700 --> 00:03:57,790

INTERSTELLAR CLOUDS OF DUST AND GLOWING GASES.

47

00:03:57,790 --> 00:04:03,800

Hubble: My program, in short, is an attempt to find all I possibly can concerning the

48

00:04:03,800 --> 00:04:10,410

nature, form, and location of the galactic nebulae and their relation to the stars involved.

49

00:04:10,410 --> 00:04:12,520

Edwin Powell Hubble"

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00:04:12,520 --> 00:04:18,410

IN OCTOBER OF 1923, HUBBLE TURNS HIS ATTENTION TO THE ANDROMEDA NEBULA. HE DISCOVERS THE

51

00:04:18,410 --> 00:04:24,370

FIRST VARIABLE STAR IN THE NEBULA THAT COULD BE USED TO CALCULATE ITS DISTANCE FROM EARTH.

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00:04:24,370 --> 00:04:29,050

HUBBLE ESTIMATES ANDROMEDA TO BE AT LEAST A MILLION LIGHT YEARS AWAY...

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00:04:29,050 --> 00:04:33,680

HE THEN APPLIES THE SAME TECHNIQUE TO OTHER SPIRAL NEBULAE. AND DISCOVERS THAT OUR UNIVERSE

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00:04:33,680 --> 00:04:36,830
EXTENDS FAR BEYOND OUR LOCAL MILKY WAY.

55
00:04:36,830 --> 00:04:43,830
Owen: These objects had to be at a very great distance larger than any distances that had

56
00:04:44,050 --> 00:04:49,310
been proposed up to that time. This was stunning announcement.

57
00:04:49,310 --> 00:04:56,189
WHAT'S MORE, HE FINDS THAT OUR IMMENSE UNIVERSE IS GROWING EVEN LARGER... THIS EXPANSION RATE

58
00:04:56,189 --> 00:05:01,340
IS LATER COINED THE HUBBLE CONSTANT. THIS NOTION OF AN EXPANDING UNIVERSE BECOMES THE

59
00:05:01,340 --> 00:05:06,599
FOUNDATION OF THE "BIG BANG" THEORY WHICH EXPLAINS HOW THE UNIVERSE BEGAN.

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00:05:06,599 --> 00:05:13,599
Owen: "I think that having the Hubble Space Telescope really seals the fame for Edwin

61
00:05:15,129 --> 00:05:22,129
Hubble and it does keep his name in the forefront and it helps him to be one of those people

62
00:05:24,229 --> 00:05:27,879
that really gets remembered from the 20th Century."

63
00:05:27,879 --> 00:05:33,210
A CENTURY THAT'S SEEN BOTH A MAN AND A TELESCOPE NAMED HUBBLE... TRANSFORM OUR VIEW OF THE

64

00:05:33,210 --> 00:05:39,870

COSMOS FROM A SMALL AND STATIC ISLAND OF STARS
TO A VAST AND GROWING OCEAN OF GALAXIES.